
List of Contents

NUMBER 1/2

**L. M. García-Raffi,
S. Romaguera and
E. A. Sánchez-Pérez**

**J. Buchanan,
R. P. Gilbert, A. Wirgin
and Y. Xu**

**M. D. Roselló,
J. R. Serrano, X. Margot
and J. M. Arnau**

**A. Blasco, L. Sanz and
R. Bravo de la Parra**

X. Song and L. Chen

**I. Kozlova, M. Singh
and A. Easton**

**M.-S. Hwang, C.-C. Lee
and Y.-L. Tang**

I. Bonzani and L. Mussone

**E. Deleersnijder,
A. Mouchet,
E. J. M. Delhez
and J.-M. Beckers**

**S. R. David and
J. W. Seaman, Jr.**

K. Q. Lan and J. H. Wu

L. Hadji

G. Vallet and D. Trujillo

Y.-K. Lin

V. Sundarapandian

K. H. Kwek and W. Zhang

1 Sequence Spaces and Asymmetric Norms in the Theory of Computational Complexity

13 Unambiguous Identification of the Uneven Boundary of a Half-Space Probed by Acoustic or Electromagnetic Waves

33 Analytic-Numerical Approach to Flow Calculation in Intake and Exhaust Systems of Internal Combustion Engines

47 Approximate Reduction of Multiregional Birth-Death Models with Fast Migration

67 Modelling and Analysis of a Single-Species System with Stage Structure and Harvesting

83 Predator-Prey Models with Diffusion Based on Luckinbill's Experiment with *Didinium* and *Paramecium*

103 A Simple Remote User Authentication Scheme

109 Stochastic Modelling of Traffic Flow

121 Transient Behaviour of Water Ages in the World Ocean

129 Hierarchical Bayesian Analysis of the Carryover Effect in Two-Period Crossover Designs

139 A Fixed-Point Theorem and Applications to Problems on Sets with Convex Sections and to Nash Equilibria

147 Modelling and Asymptotic Analysis of Particle-Interface Interaction

157 A Stochastic Modelling of Crystallization in a Dispersed Medium

173 Overall-Terminal Reliability of a Stochastic Capacitated-Flow Network

183 Nonlinear Observer Design for Bifurcating Systems

189 Periodic Solutions and Dynamics of a Multimolecular Reaction System

V. N. Dorovsky, V. S. Belonosov and A. S. Belonosov	203 Numerical Investigation of Parametric Resonance in Water-Oil Structures Containing Gas
V. Sundarapandian	211 Nonlinear Observer Design for Discrete-Time Bifurcating Systems
T. Pham-Gia and N. Turkkan	217 An Optimal Two-Stage Graphical Search Planning Procedure for Submerged Targets
S. Schnell and P. K. Maini	231 Erratum to “Enzyme Kinetics Far from the Standard Quasi-Steady-State and Equilibrium Approximations”

NUMBER 3

MATHEMATICAL MODELLING OF NONLINEAR SYSTEMS A Tribute to Professor John Brindley

G. Wake and M. Nelson	xiii Preface
G. Wake and M. Nelson	xv Foreword
J. Cisternas and P. Holmes	233 Buckling of Extensible Thermoelastic Rods
R. Fairlie and J. F. Griffiths	245 Oscillatory Combustion in Closed Vessels under Microgravity
R. I. Leine and D. H. van Campen	259 Discontinuous Bifurcations of Periodic Solutions
C. Lowe and J. Clarke	275 A Class of Exact Solutions for the Euler Equations with Sources: Part 1
A. C. McIntosh, J. Brindley and J. F. Griffiths	293 An Approximate Model for the Ignition of Reactive Materials by a Hot Spot with Reactant Depletion
H. Malchow and S. V. Petrovskii	307 Dynamical Stabilization of an Unstable Equilibrium in Chemical and Biological Systems
A. Öztekin, B. R. Seymour and E. Varley	321 Unsteady Stratified Swirling Shear Flows
B. D. Sleeman and I. P. Wallis	339 Tumour Induced Angiogenesis as a Reinforced Random Walk: Modelling Capillary Network Formation without Endothelial Cell Proliferation
G. H. M. van der Heijden and J. M. T. Thompson	359 The Chaotic Instability of a Slowly Spinning Asymmetric Top
R. O. Weber, G. N. Mercer and H. S. Sidhu	371 Combustion Leftovers
A. Wilson	379 Complex Spatial Systems: Challenges for Modellers
K. Zhang and D. Gubbins	389 Convection-Driven Hydromagnetic Waves in Planetary Fluid Cores

NUMBER 4/5

S. Motta 403 A New Formulation and Gauge Invariance of the MW-CRF Method for Kinetic Equations

W.-T. Li 411 Classification Schemes for Positive Solutions of Nonlinear Differential Systems

V. N. Dorovsky 419 Brownian Motion and Reversible Hydrodynamic Equations of Bubble Liquid

S. Brzyczy 435 Existence of Solutions of Nonlinear Infinite Systems of Parabolic Differential-Functional Equations

**S.-D. Lin,
H. M. Srivastava
and P.-Y. Wang** 445 Some Families of Hypergeometric Transformations and Generating Relations

T. Sawik 461 An Exact Approach for Batch Scheduling in Flexible Flow Lines with Limited Intermediate Buffers

A. d'Onofrio 473 Pulse Vaccination Strategy in the SIR Epidemic Model: Global Asymptotic Stable Eradication in Presence of Vaccine Failures

**L. Esteva-Peralta and
J. X. Velasco-Hernández** 491 *M*-Matrices and Local Stability in Epidemic Models

X. Yang 503 Oscillation Results for Second-Order Half-Linear Differential Equations

Y.-K. Liu and B. Liu 509 Random Fuzzy Programming with Chance Measures Defined by Fuzzy Integrals

Y. Yavin 525 Modelling of the Motion of a Cart on a Smooth Rigid Surface

S. Evje and K. K. Fjelde 535 Relaxation Schemes for the Calculation of Two-Phase Flow in Pipes

H.-S. Shih 569 An Interactive Approach for Integrated Multilevel Systems in a Fuzzy Environment

L. Egghe 587 Development of Hierarchy Theory for Digraphs Using Concentration Theory Based on a New Type of Lorenz Curve

**Z.-H. Fong, T.-W. Chang and
C.-W. Tsay** 603 Mathematical Model for Parametric Tooth Profile of Spur Gear Using Line of Action

J. Wieszorek 615 Phase Spaces for Quasi-Linear Hyperbolic Functional Differential Equations with Unbounded Delay

NUMBER 6

LYAPUNOV'S METHODS IN STABILITY AND CONTROL

E. A. Galperin

xiii Preface

N. Seube, R. Moitie and G. Leitmann	633 Viability Analysis of an Aircraft Flight Domain for Take-Off in a Windshear
A. V. Karapetyan	643 Invariant Sets of Mechanical Systems
A. Domoshnitsky and Ya. M. Goltser	663 Approach to Study of Bifurcations and Stability of Integro-Differential Equations
E. A. Galperin	679 Generalized Perturbation Equation for Integral and Integro-Differential Equations and Applications
V. Kolmanovskii and L. Shaikhet	691 Construction of Lyapunov Functionals for Stochastic Hereditary Systems: A Survey of Some Recent Results
E. A. Galperin	717 Translational Symmetry of Certain Integrals with Application to the Calculus of Variations and Optimal Control
B. Shklyar	729 Approximate Observability of Abstract Evolution Equation with Unbounded Observation Operator

NUMBER 7/8

M. A. Noor	737 Modified Resolvent Algorithm for General Mixed Quasi-Variational Inequalities
K. Balachandran, J. Y. Park and I. H. Jung	747 Existence of Solutions of Nonlinear Extensible Beam Equations
W. Grygierzec	755 The Closure Problem for the Chain of Moment Equations for Linear Diffusion with Random Drift
S. T. R. Pinho, H. I. Freedman and F. Nani	773 A Chemotherapy Model for the Treatment of Cancer with Metastasis
J. A. Martín and O. García	805 Variable Multistep Methods for Higher-Order Delay Differential Equations
D. Palaniappan	821 Electrostatics of Two Intersecting Conducting Cylinders
Y. Yavin	831 Modelling of the Motion of a Disk Rolling on a Torus
A. Amassad, K. L. Kuttler M. Rochdi and M. Shillor	839 Quasi-Static Thermoviscoelastic Contact Problem with Slip Dependent Friction Coefficient
P. C. Paris and L. Zhang	855 A Disk Rolling on a Horizontal Surface Without Slip
C. Ciuleu, T.-V. Hoarau-Mante and M. Sofonea	861 Viscoelastic Sliding Contact Problems with Wear
H. T. Banks, G. A. Pinter and O. H. Yeoh	875 Analysis of Bonded Elastic Blocks
E. Mamontov, M. Willander and J. Weiland	889 Stochastic Continuum Mechanics—A Thermodynamic-Limit-Free Alternative to Statistical Mechanics: Equilibrium of Isothermal Ideal Isotropic Uniform Fluid

A. E. Hamza	909 Stability of Abstract Difference Equations
S. P. Radzevich	921 IR-Mapping Based Method for Designing of Form Cutting Tool for Sculptured Surface Machining
J. Schmeelk	939 Wavelet Transforms on Two-Dimensional Images
S. Rachev	949 Errata

NUMBER 9/10

M. S. Mongiovì	951 Nonlinear Extended Thermodynamics of a Dilute Non-viscous Gas
Y. S. Wang and M. Z. Qin	963 Multisymplectic Schemes for the Nonlinear Klein-Gordon Equation
S.-J. Cho, U.-S. Choi and H.-D. Kim	979 Behavior of Complemented CA Whose Complement Vector is Acyclic in a Linear TPMCA
T. Hayat, K. Hutter, S. Asghar and A. M. Siddiqui	987 MHD Flows of an Oldroyd-B Fluid
X. Tang, Z. Zhou and Y. Shi	997 The Error Bounds of Combined Forecasting
Z. Ding, H. Leung and Z. Zhu	1007 A Study of the Transiently Chaotic Neural Network for Combinatorial Optimization
S. H. Saker and B. G. Zhang	1021 Oscillation in a Discrete Partial Delay Nicholson's Blowflies Model
K. Ezzinbi and J. H. Liu	1027 Nondensely Defined Evolution Equations with Nonlocal Conditions
Z. Lu, X. Chi and L. Chen	1039 The Effect of Constant and Pulse Vaccination on SIR Epidemic Model with Horizontal and Vertical Transmission
S. El Yacoubi and A. El Jai	1059 Cellular Automata Modelling and Spreadability
K. Li	1075 Minimizing the Probability of Load Imbalance in Heterogeneous Distributed Computer Systems
M. Sabatini and L. G. Trussoni	1085 Localizing Attractors via a Generalized La Salle Principle
M. Abdellaoui, A. El Jai and M. Shillor	1099 Cellular Automata Model for a Contact Problem
A. Bernardini and P. E. Ricci	1115 Bell Polynomials and Differential Equations of Freud-Type Polynomials

F. G. Arenas, M. L. Puertas and S. Romaguera	1121 Ordered Fractal Semigroups as a Model of Computation
V. Casulli and P. Zanolli	1131 Semi-Implicit Numerical Modeling of Nonhydrostatic Free-Surface Flows for Environmental Problems
C. Vani and A. Avudainayagam	1151 Regularized Solution of the Cauchy Problem for the Laplace Equation Using Meyer Wavelets
J.-L. Lamotte, B. Molina and M. Raydan	1161 Smooth and Adaptive Gradient Method with Retards
 NUMBER 11–13	
A. Bellouquid	1169 From Microscopic to Macroscopic Models: Asymptotic Analysis of the Broadwell Model Toward the Wave Equation
S. Brzydłczy	1183 Existence and Uniqueness of Solutions of Infinite Systems of Semilinear Parabolic Differential-Functional Equations in Arbitrary Domains in Ordered Banach Spaces
L. Aggoun	1193 Kalman Filtering of a Space-Time Markov Random Field
Y. C. Li	1211 Existence of Chaos in Evolution Equations
S. C. H. Leung, Y. Wu and K. K. Lai	1221 A Robust Optimization Model for a Cross-Border Logistics Problem with Fleet Composition in an Uncertain Environment
S.-K. Kim and J. H. Dshalalow	1235 Stochastic Disaster Recovery Systems with External Resources
M. F. Mahmood	1259 Analytic Method for Solving Coupled Nonlinear Schrödinger Equations with Oscillating Terms Describing Polarized Soliton Oscillations
Y. Wang and N. Cercone	1265 Fast Searches in a Recommendation Session
Y. Yavin and C. Frangos	1275 The Controllability of a System of Two Bank-To-Turn Airborne Vehicles
A. S. Belenky	1279 Cooperative Games of Choosing Partners and Forming Coalitions in the Marketplace
M. Jerry and N. Raïssi	1293 The Optimal Strategy for a Bioeconomical Model of a Harvesting Renewable Resource Problem
B. G. Zhang and X. Deng	1307 Oscillation of Delay Differential Equations on Time Scales
S. Liu, L. Chen and R. Agarwal	1319 Recent Progress on Stage-Structured Population Dynamics
R. Henda and K. Alhumaidi	1361 Spatiotemporal Patterns in a Two-Dimensional Reaction-Diffusion-Convection System: Effect of Transport Parameters

A. Pons-Porrata, J. Ruiz-Schulcloper and J. F. Martínez-Trinidad	1375 RGC: A New Conceptual Clustering Algorithm for Mixed Incomplete Data Sets
W.-C. C. Chan	1387 A Note on Diffeomorphism and Periodic Differential Equations
B. Kaźmierczak and K. Piechór	1393 Phase Boundary Solutions to Model Kinetic Equations via the Conley Index Theory. Part II
N. Singh, V. S. S. Yadavalli and M. S. Peiris	1409 A Note on the Modelling and Analysis of Vector Arma Processes with Nonstationary Innovations
F. Qiao, P. Yi, H. Yang and S. Devarakonda	1425 Fuzzy Logic Based Intersection Delay Estimation
I. Kramer and G. M. Shearer	1435 Quantifying the Strength and Durability of Induced Immunity to HIV Infection in Women Engaging in Unprotected Sexual Contacts with Infected Men
T. Huang	1459 Asymptotic Analysis of Industrial Dynamical Model

